

# IC-V80

VHF FM Handheld Transceiver

## QST Product Review

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 **ICOM®**

## ICOM IC-V80 Handheld VHF Transceiver

Reviewed by Rick Palm, K1CE  
ARRL Contributing Editor

Handheld radios are a dime a dozen (almost literally — there are a lot of choices for around \$100), so what sets one model apart from the others? That was the main question on my mind as I tested the IC-V80, along with my mindset and perspective as an ARES® emergency communications field operator. If a transceiver can get the job done under the potentially extreme conditions of a disaster area, then surely it would meet the more benign needs of casual operation.

### Taking It for a Test Ride

To answer this question and others, I took the IC-V80 out to try to simulate demanding, if not extreme, conditions: I rode my bicycle up and down coastal route A1A on the upper east coast of Florida with the high ambient noise of the ocean and wind, with the review unit tucked in a Camelbak waist pouch strapped around my back. The flexible antenna stuck up through a notch sewn on top of the little pack (a perfect way to carry a small handheld, by the way: the model is the Camelbak FLASHLO with the water bladder removed).

One of ICOM's main claims for this radio is loud audio, which would obviously be a huge asset in a noisy disaster area (think mammoth government response vehicles lumbering around, and banks of gasoline engine driven generators chugging away). ICOM says that the unit puts out 750 mW of "loud and intelligible" audio from a "larger" (36 mm) speaker, employing a BTL (bridge-tied load) amplifier that doubles the audio output.

Note that the Lab tests were performed with the external speaker jack, which has a lower audio output rating. See Table 1 for details.

I was able to easily hear the other operator's intelligible voice from a local repeater as I rode along the ocean, albeit with the volume turned up to the maximum limit. But, even with max audio, the audio was easily understandable. In this regard, the claims for this unit meet actual performance

standards in my little field test.

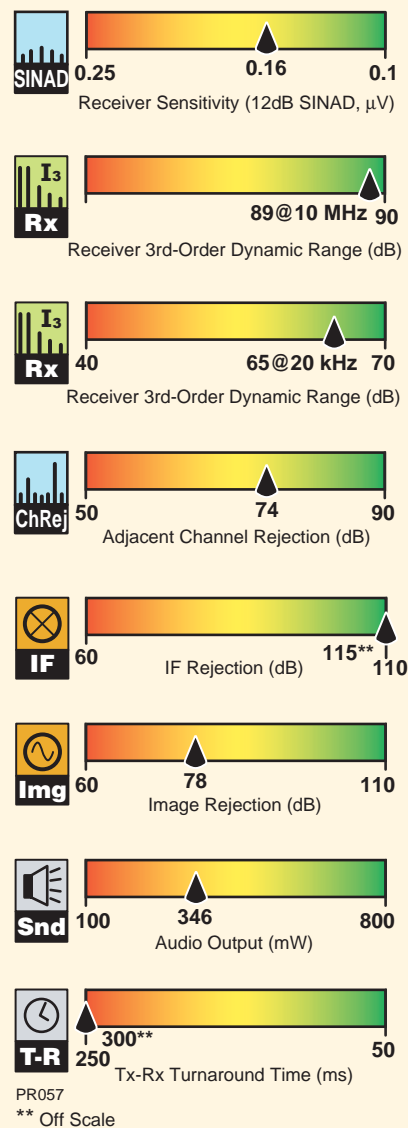
Test #2 — I tried the same set-up, only this time I rode my noisy Harley-Davidson Sportster to see if I could still copy the audio from the radio. Result: I could copy voice transmissions with no problem with my helmet on, engine idling and the motorcycle stopped. However, it was too much to ask of the radio when I was actually riding with the engine louder and the wind blowing in my face. I could not copy the voice, and indeed I could hardly hear it at all. The bottom line as far as audio output goes, is that it is superior to other radios I have used and an asset in field conditions with high ambient noise levels. This is a good selling point for this radio.

### Ruggedly Built

Also up for consideration were other aspects I was interested in as an emergency field operator, especially ruggedness. In trying field conditions, you know that the radio will be dropped, kicked, sat on, dusted with dirt and grime, and splashed by rain, oil, gasoline and other fluids. While I didn't drop kick it around, the unit



### Key Measurements Summary



### Bottom Line

The IC-V80 is a rugged 2 meter handheld with attractive features for emergency communications as well as daily use.

does seem to be tough. The unit comes with a robust belt clip, not a flimsy little clip as with some radios I have owned, and I have had a lot of them over the years.

The manufacturer claims that the unit is *water-resistant* (which does not equate to *waterproof*, in my understanding) and has protection against dust and dirt under an industrial code of IP54. (IP is an Ingress Protection rating used to specify the environmental protection — electrical enclosure — of electrical equipment. The first number refers to protection against solid objects — “5” in this case means that the unit is “protected against dust limited ingress.” The second number refers to protection against liquids — “4” in this case means that the unit is protected “against water sprayed from all directions — limited ingress permitted.” Search the Internet for more info on this rating system.) ICOM also claims the unit has been “tested to and passed 11 categories of MIL-STD-810 environmental tests.”

I personally like, and have always liked, the classic, bombproof BNC connector and flexible antenna system that is employed on this radio. There is plenty of transmitter power, also potentially important in remote or mountainous search and rescue (SAR) or disaster areas: the HIGH power setting will yield 5.5 W (see Table 1 for tests conducted by the ARRL Lab). A more conservative (and battery saving) 2.5 W is the MID level, and the LOW level provides 0.5 W output. ICOM claims that the operator can get up to 13 hours of operating time with the supplied 7.2 V 1400 mAh NiMH battery pack (BP-264), or up to 19 hours with the optional Li-ion battery pack (BP-265).

The size of the unit seems perfect to me — not too big, like the old units of the ’70s, and not too small, like some of the current miniature radios. The keypad, while not illuminated, is easy to read and the buttons are large enough for ease of pushing. (I found that I didn’t miss the illuminated keypad.) The ON/OFF button, however, is curiously small, compared to the other buttons. A big VOLUME (and SET function selector) knob on top of the rig is easy to use, even with HAZMAT gloves on.

## Plenty of Useful Features

There are 207 memory channels available, including 200 regular channels, six scan edges and one call channel. They are easy to program. The channel name is programmable with five characters for easy recognition — likely handy in a disaster area with unfamiliar repeater frequencies. You could program a channel as “ICP,” for example, for Incident Command Post, or “HBASE” for Helibase under the Incident Command System nomenclature.

**Table 1**  
**ICOM IC-V80, serial number 25001171-9**

| <b>Manufacturer's Specifications</b>  | <b>Measured in ARRL Lab</b>  |
|---|--|
| Frequency coverage: Receive, 136-174 MHz; transmit, 144-148 MHz.  | Receive and transmit, as specified.  |
| Modes: FM, NFM.   | As specified.  |
| Power requirements: 7.2 V dc (battery only) <sup>†</sup> receive, 310 mA (max audio, internal speaker), 180 mA (max audio, external speaker), 65 mA standby, 20 mA power save; transmit, 1.4 A (high), 0.9 A (middle), 0.6 A (low). | Receive, battery power, 266 mA (max volume, no signal, lights on); 174 mA (max vol, no signal, lights on, external speaker); 68 mA (standby, lights off), 20 mA (power save on).<br>Transmit, 1.4 A (high), 0.95 A (middle), 0.5 A, (low) at 8.2 V dc (full charge). |
| <b>Receiver</b>   | <b>Receiver Dynamic Testing</b>  |
| FM sensitivity: 12 dB SINAD, 0.14 $\mu$ V.  | For 12 dB SINAD, 146 MHz, 0.16 $\mu$ V; 162.4 MHz, 0.14 $\mu$ V.   |
| FM two-tone, third-order IMD dynamic range: Not specified.  | 20 kHz offset: 65 dB;<br>10 MHz offset: 89 dB  |
| FM two-tone, second-order IMD dynamic range: Not specified.   | 146 MHz, 87 dB.  |
| Adjacent-channel rejection: Not specified.  | 20 kHz offset: 74 dB.  |
| Spurious response: Not specified.   | IF rejection, 115 dB;<br>image rejection, 78 dB.   |
| Squelch sensitivity: 0.1 $\mu$ V.   | At threshold, 0.1 $\mu$ V; 0.27 $\mu$ V (max).   |
| Audio output: 0.75 W at 10% THD into 16 $\Omega$ (internal speaker), 0.45 W at 10% THD into 8 $\Omega$ (external speaker).  | 346 mW at 3.2% THD into 8 $\Omega$ (external speaker).*  |
| <b>Transmitter</b>  | <b>Transmitter Dynamic Testing</b>   |
| Power output: 5.5 W (high), 2.5 W (middle), 0.5 W (low).  | 5.7 W (high), 2.5 W (middle), 0.5 W (low). at 8.2 V dc (full charge).  |
| Spurious signal and harmonic suppression: >60 dB.   | >70 dB, meets FCC requirements.  |
| Transmit-receive turnaround time (PTT release to 50% of full audio output): Not specified.  | Squelch on, S9 signal, 300 ms.   |
| Receive-transmit turnaround time (“tx delay”): Not specified.   | 134 ms.  |
| Size (height, width, depth): 4.4 × 2.2 × 1.2 inches; weight, 12.4 ounces.   |  |
| Price: IC-V80, \$120. OPC-478UC USB cable, \$60; CS-V80 software, \$50; HS-95 headset, \$160 and OPC-2004 cable, \$25.  |  |

<sup>†</sup>BP-264 7.2 V, 1400 mAh NiMH battery and wall charger supplied. Available options: BP-265 7.4 V, 1900 mAh Li-ion battery, \$70; BC-191 drop-in rapid charger for BP-264, \$70; BC-193 drop-in rapid charger for BP-265, \$70; BP-263 battery case for 6 AA cells, \$30; OPC-515L dc power cable, \$20.

\*Volume set to level 18. Maximum output is attainable, but exceeds 10% THD. The volume control changes in steps rather than continuously. Measurements with an 8  $\Omega$  load at the speaker jack: level 18, 346 mW at 3.2% THD; level 19, 435 mW at 14.5% THD; level 24, 480 mW at 22% THD. THD at 1.195 V RMS, 2%.

Built-in CTCSS/DCS tone codes provide quiet standby and allow you to use tone access repeaters. The tone scan function detects the subaudible tone that is used for repeater access, also very useful in unfamiliar territory.

The IC-V80 has an internal VOX (voice operated transmit) function for what ICOM calls “convenient hands free operation with a compatible optional headset and plug adapter cable,” but I did not test this option. The VOX gain and VOX delay time are adjustable.

A large keypad button cycles among four settings: VFO/MR (memory recall)/CALL and, although not labeled, weather channel (10

channels), also handy for field deployments. There is also a weather alert function.

The usual scan, program, memory, skip and priority functions are available, along with a power save function, time-out timer setting, repeater lockout and busy channel lockout. It’s PC programmable with optional CS-V80 software, and transceiver-to-transceiver cloning is also optional. Frequency selection is by direct keypad entry or the large UP and DOWN ARROW buttons. Other functions are provided including DTMF memory channels, auto power off, LCD backlight and wide/narrow channel spacing.

I like the large display characters that are easy to read, even though my eyesight isn’t

what it used to be. I like the fact that the unit is easy to use, simple with just the most basic functions, without superfluous functions that only a total techno-geek would use. It feels rock solid.

The IC-V80 comes with a BC-192 drop-in slow battery charger, which I liked, and a drop-in rapid charger is available. This charger can also run from 12 V dc, so you can charge the battery while operating in a vehicle.

A simple AA battery case is also available and would be extremely important in a disaster situations in which there is no power with which to charge batteries. All you would need to operate for days is a decent stock of AA alkaline batteries. The IC-V80 Sport model comes standard with the AA cell holder instead of a rechargeable battery and is available at a lower price.

The audio quality reports I received from both repeater users and simplex op-

erators were all fine. Microphone gain can be changed in the SET MODE, along with a whole host of other adjustments that are standard on most other radios today.

The ultimate litmus test for any review unit is whether or not the reviewer would buy one for him or herself. Not only would I consider buying one, I did.

*Manufacturer:* ICOM America, 2380 116th Ave NE, Bellevue, WA 98004; tel 800-872-4266; **[www.icomamerica.com](http://www.icomamerica.com)**.